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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,546	04/22/2005	Tetsunori Itabashi	7217/71164	3808

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EXAMINER

SAUNDERS JR, JOSEPH

ART UNIT	PAPER NUMBER
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2615

MAIL DATE	DELIVERY MODE
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10/04/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/532,546

Applicant(s)

ITABASHI ET AL.

Examiner

Joseph Saunders

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 April 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This is the initial office action based on the communication filed May 25, 2005.

Claims 1 – 13 are currently pending and considered below.

Drawings

2. Figures 1 – 5 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Ftg as disclosed on page 14 of the specification. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New

Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 – 9 and 11 – 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Bienek et al. (WO 02/078388 A2), hereinafter Bienek.

Claims 1 and 7: Bienek discloses a reproducing method and apparatus for reproducing an audio signal (method and apparatus to create a sound field), comprising the steps of: delivering an audio signal (input signal 101) to a first plurality of digital filters (delay means 1508 or adjustable digital filter can also be arranged to apply delays); delivering outputs of the first plurality of digital filters to a plurality of speakers (output transducers

104), respectively, constituting a speaker array to form a sound field; respectively setting predetermined delay times at the first plurality of digital filters so that respective propagation delay times required until the audio signal arrives at a first point within the sound field through the first plurality of digital filters and the respective plurality of speakers coincide with each other (Figure 7C and Figure 8); delivering the audio signal (input signal 101) to a second plurality of digital filters (adjustable digital filter means 1512); respectively delivering outputs of the second plurality of digital filters to the plurality of speakers (output transducers 104); and respectively setting predetermined transfer characteristics (coefficients and Figures 11A – 11D) at the second plurality of digital filters so as to control sound at a second point within, the sound field among sounds formed from outputs of the first plurality of digital filters (Figure 7C and Figure 8). (Bienek teaches that "one or the other of the signal delay means (1508) and adjustable digital filter (1512) may also be dispensed with," Page 18 Lines 15 – 30. Bienek further teaches that the outputs of multiple Distributors can be combined by adders before reaching the DPAA, Figure 15. Therefore one of the Distributors in Figure 15 could be configured as taught by Bienek to include only signal delay means (1508) and the other configured to include only adjustable digital filter means (1512). The outputs of each distributor are then combined through the use of adders and provided to the same speaker array resulting in for example Figure 8 where sound is directed in directions (B1), (B2), and (B3).)

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Claim 2: Bienek discloses the reproducing method for reproducing an audio signal as set forth in claim 1, wherein a sound wave radiated from the speaker array is reflected on a wall surface, and arrives at the first point (Figure 8).

Claim 3: Bienek discloses the reproducing method for reproducing an audio signal as set forth in claim 1, wherein the second point is at substantially the same location as the first point (The different sound beams (B1), (B2), and (B3) are all directed to substantially the same point of the listener (X), Figure 8).

Claim 8: Claim 8 is the apparatus performing the method of claim 2 above and since this is also disclosed by Bienek, claim 8 is rejected for the same reasons as claim 2 above.

Claim 9: Claim 9 is the apparatus performing the method of claim 3 above and since this is also disclosed by Bienek, claim 9 is rejected for the same reasons as claim 3 above.

Claims 4 and 11: Bienek discloses a reproducing method and apparatus for reproducing an audio signal (method and apparatus to create a sound field), comprising: delivering an audio signal (input signal 101) to a first plurality of digital filters (delay means 1508 or adjustable digital filter can also be arranged to apply delays); delivering outputs of the first plurality of digital filters to a respective plurality of speakers

(output transducers 104) constituting a first speaker array to form a sound field; respectively setting predetermined delay times at the first plurality of digital filters so that respective propagation delay times required until the audio signal arrives at a first point within the sound field through the first plurality of digital filters and the respective plurality of speakers of the first speaker array coincide with each other (Figure 7C and Figure 8); delivering the audio signal (input signal 101) to a second plurality of digital filters; delivering outputs of the second plurality of digital filters (adjustable digital filter means 1512) to a respective plurality of speakers (output transducers 104) constituting a second speaker array ; and respectively setting predetermined transfer characteristics (coefficients and Figures 11A – 11D) at the second plurality of digital filters so as to control sound at a second point within the sound field among sounds formed from outputs of the first plurality of digital filters (Figure 7C and Figure 8). (Bienek teaches that “one or the other of the signal delay means (1508) and adjustable digital filter (1512) may also be dispensed with,” Page 18 Lines 15 – 30. Bienek further teaches that the outputs of multiple Distributors can be sent to a first and second speaker array, Figure 14. Therefore one of the Distributors in Figure 15 could be configured as taught by Bienek to include only signal delay means (1508) and the other configured to include only adjustable digital filter means (1512). The outputs of each distributor are then sent to respective first and second speaker arrays in for example Figure 8 where sound is directed in directions (B1), (B2), and (B3).)

Claim 5: Bienek discloses the reproducing method for reproducing an audio signal as set forth in claim 4, wherein a sound wave radiated from the speaker array is reflected on a wall surface, and arrives at the first point (Figure 8).

Claim 6: Bienek discloses the reproducing method for reproducing an audio signal as set forth in claim 4, wherein the second point is at substantially the same location as the first point (The different sound beams (B1), (B2), and (B3) are all directed to substantially the same point of the listener (X), Figure 8).

Claim 12: Claim 12 is the apparatus performing the method of claim 5 above and since this is also disclosed by Bienek, claim 12 is rejected for the same reasons as claim 5 above.

Claim 13: Claim 13 is the apparatus performing the method of claim 6 above and since this is also disclosed by Bienek, claim 13 is rejected for the same reasons as claim 6 above.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bienek in view of Foster et al. (US 5,815,578), hereinafter Foster.

Claim 10: Bienek discloses the reproducing apparatus for reproducing an audio signal as set forth in claim 7, but does not disclose further comprising a plurality of subtraction circuits respectively supplied with outputs of the first plurality of digital filters and outputs of the second plurality of digital filters, in which outputs of the plurality of subtraction circuits are respectively delivered to the plural speakers. Bienek does disclose reducing "side lobes" of the sound beams by providing a window function to improve directivity. Foster teaches another method that does better than just reducing "side lobes" or "leakage" it cancels "leakage". Foster teaches "In one embodiment, the present invention provides a leakage canceling signal which cancels the surround sound leakage signal in the vicinity of listener 100 so that the perception of listener 100 that the surround sound signal is emanating from reflecting surfaces is improved. For the surround sound leakage signal, a leakage canceling signal is generated in the vicinity of the listener by applying a leakage transmission signal to a direct speaker. The leakage canceling signal effectively suppresses the surround sound leakage signal so that it does not disturb the listener's perception. The leakage transmission signal is derived as described below from a measured transfer function which describes the transmission and propagation of the surround sound leakage signal to the vicinity of the listener and the transfer function which describes the transmission and propagation of a direct signal

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to the listener,” Column 5 Lines 22 – 36 see also Figure 3 and Column 8 Lines 18 – 57). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the transfer function, as taught by Foster, of the adjustable digital filters as disclosed by Bienek, thereby improving the directionality of the surround signal in the system of Bienek.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Saunders whose telephone number is (571) 270-1063. The examiner can normally be reached on Monday - Thursday, 9:00 a.m. - 4:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



JS
September 25, 2007



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SUPERVISORY PATENT EXAMINER